Course Unit Descriptor

**Study Programme:** Information Technology

**Course Unit Title**: ARTIFICIAL INTELLIGENCE SYSTEMS

**Course Unit Code:** OAS112

**Name of Lecturer(s):** Professor Ivana Berković, PhD

**Type and Level of Studies:** Bachelor Academic Degree

**Course Status (compulsory/elective):** Compulsory

**Semester (winter/summer):** Summer

**Language of instruction:** English

**Mode of course unit delivery (face-to-face/distance learning):** Face-to-face

**Number of ECTS Allocated:** 6

**Prerequisites:** None

**Course Aims:**

The main directions of development and achieved results in the field of artificial intelligence. The results are interpreted except for technical applications and in terms of new knowledge about knowledge representation, problem solving, the importance of heuristics, search strategies, the processes of reasoning and learning.

**Learning Outcomes:**

Students acquire knowledge and skills to work in the field of theory and application of automatic reasoning and logical programming. They are trained to clearly define the problem and how to solve it using the appropriate software tools of artificial intelligence.

**Syllabus:**

*Theory*

The concept of artificial intelligence systems. Syntax and heuristic search strategy of the state space. Automatic reasoning and deductive systems. The method of resolution. Unification algorithm. Specific form of resolution. Applications: query dialog systems, combinatorial scheduling, deductive databases, program correctness. The modalities of application of automatic reasoning in teaching and learning. PROLOG and logic programming. The concepts of open and closed world. The concept and development of machine learning. Elements of pattern recognition. Sorting and classification. Introduction to expert systems. Knowledge base and the reasoning mechanisms.

*Practice*

Creating tasks in a computer lab. Students take the practical part of the material in the computer lab by solving mandatory tasks. Demonstration of the work of various artificial intelligence systems and development tools. Through the preparation of seminar work, students apply theoretical knowledge to a concrete practical problem.

**Required Reading:**


1. Stuart Russell, Peter Norving, Artificial Intelligence - A Modern Approach, Prentice Hall, Pearson Education International, New Jersey, USA, 2011.
2. Ivana Berković, The Elements of Artificial Intelligence Through Examples and Assignments (in Serbian), Technical Faculty "Mihajlo Pupin", Zrenjanin, 2006.
3. Petar Hotomski, Artificial Intelligence Systems (in Serbian), Technical Faculty "Mihajlo Pupin", Zrenjanin, 2006.

| **Weekly Contact Hours:** 4 | **Lectures:** 2 | **Practical work:** 2 | |
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| **Teaching Methods:**<br>Lectures and students group work. | | | |
| **Knowledge Assessment (maximum of 100 points): 100** | | | |
| **Pre-exam obligations** | points | **Final exam** | points |
| Active class participation | 10 | written exam | 30 |
| Test I and Test II | 20 | oral exam | 20 |
| Preliminary exam(s) | 10 | | |
| Seminar(s) | 10 | | |